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10/705,313	11/10/2003	Akira Miyashita	1232-5200	4458
27123	7590	02/06/2006	EXAMINER	
MORGAN & FINNEGAN, L.L.P. 3 WORLD FINANCIAL CENTER NEW YORK, NY 10281-2101			GOLDBERG, BRIAN J	
			ART UNIT	PAPER NUMBER
			2861	

DATE MAILED: 02/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/705,313	MIYASHITA, AKIRA	
	Examiner	Art Unit	
	Brian Goldberg	2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 December 2005.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17, 22 and 24 is/are rejected.
- 7) ☒ Claim(s) 18-21, 23 and 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 1-24 are objected to because of the following informalities:
2. Regarding claims 1-3, 8-10, 22, and 24 "each of nozzles" in line 3 or 4 of the claim should be changed to "each nozzle". Also, in claim 9, "determining whether the discharging state of each of the nozzles of the head on the basis of..." is not proper. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1, 7, 8, 13-15, 22, and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Bruch et al. (US Patent 6517183).
2. Regarding claim 1, Bruch et al. disclose "A method for determining discharging state from each nozzle of a head which discharges liquid droplets (400 of fig 4), comprising: a driving step of driving each of nozzles of the head to discharge liquid droplets (905 of fig 9 and col 10 ln 12-14); a storage step of detecting a discharging state from each nozzle of the head driven in said driving step (810 of fig 8 and col 6 ln

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38-41) and storing the discharging state as a physical amount in a memory (530 of fig 5, col 10 ln 4-7); a calculation step of calculating an average value and a standard deviation of the physical amounts stored in the memory in said storage step and obtaining a threshold (col 6 ln 15-17, col 11 ln 30-35) for determining whether the discharging state from each of nozzles of the head is normal or abnormal on the basis of the average value and the standard deviation (col 11 ln 66 – col 12 ln 1, col 12 ln 20-24); and a determination step (col 6 ln 63-65, col 7 ln 24-27) of determining whether the discharging state from each nozzle is normal or abnormal (col 7 ln 24-27), on the basis of the threshold obtained in said calculation step (col 11 ln 26-30) and the physical amount corresponding to the nozzle.”

3. Regarding claim 7, Bruch et al. disclose “in said driving step, each nozzle of the head is driven a plurality of number of times (col 4 ln 7-11).” Each nozzle ejects multiple drops and is therefore driven a number of times.

4. Regarding claims 8, 13, and 14, Bruch et al. disclose an apparatus as claimed for performing the method set forth above with respect to claims 1, 6, and 7, respectively.

5. Regarding claim 15, Bruch et al. disclose “an ink-jet printer comprising an apparatus recited in claim 8 (col 3 ln 61-64).”

6. Regarding claim 22, Bruch et al. disclose “A method for determining discharging state from each nozzle of a head which discharges liquid droplets (400 of fig 4), comprising: a driving step of driving each of nozzles of the head to discharge liquid droplets (905 of fig 9 and col 10 ln 12-14); a storage step of detecting a discharging state from each nozzle of the head driven in said driving step (810 of fig 8 and col 6 ln

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38-41) and storing the discharging state as a physical amount in a memory (530 of fig 5, col 10 ln 4-7); a calculation step of calculating a median value and a standard deviation of the physical amounts stored in the memory in said storage step and obtaining a threshold (col 6 ln 15-17, col 11 ln 30-35) for determining whether the discharging state from each of nozzles of the head is normal or abnormal on the basis of the average value and the standard deviation (col 11 ln 66 – col 12 ln 1, col 12 ln 20-24); and a determination step (col 6 ln 63-65, col 7 ln 24-27) of determining whether the discharging state from each nozzle is normal or abnormal (col 7 ln 24-27), on the basis of the threshold obtained in said calculation step (col 11 ln 26-30) and the physical amount corresponding to the nozzle.”

7. Regarding claim 24, Bruch et al. disclose an apparatus as claimed for performing the method set forth above with respect to claim 22

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 2-4, 9-11, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bruch et al. in view of Vega et al.

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10. Regarding claim 2, Bruch et al. disclose the claimed invention as set forth above with respect to claim 1. Thus Bruch et al. meet the claimed invention except the limitations set forth in claim 2.

11. Vega et al. teach using "at least two thresholds (col 6 ln 20-24) for determining whether the discharging state from each of nozzles of the head is normal or abnormal are calculated, and in said determination step, the physical amount corresponding to each nozzle is evaluated on the basis of the at least two thresholds calculated in said calculation step (col 19 ln 47-49) and it is determined whether the discharging state from each nozzle is normal or abnormal and further comprising: a decision step of executing said driving step and said storage step again for an undetermined nozzle determined in said determination step not to be non-defective or defective (col 19 ln 49-53), and deciding a threshold for determining whether the undetermined nozzle is non-defective (col 18 ln 48-57); and a step of determining whether the undetermined nozzle is non-defective or defective on the basis of the threshold decided in said decision step (col 19 ln 49-53)." It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to so modify the calculation step and determination step as well as add a decision step and an additional determination step for undetermined nozzles. One would have been motivated to so modify Bruch et al. for the benefit of improving the accuracy of determining the condition of each nozzle as well as dealing with undetermined nozzles.

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12. Regarding claim 3, Bruch et al. disclose the claimed invention as set forth above with respect to claim 1. Thus Bruch et al. meet the claimed invention except the limitations set forth in claim 3.

13. Vega et al. teach using "at least two first thresholds for determining whether the discharging state from each of nozzles of the head is normal or abnormal are calculated (col 19 ln 47-49), and in said determination step the physical amount corresponding to each nozzle is evaluated on the basis of said at least two first thresholds calculated in said calculation step, and determining whether the discharging state from each nozzle is normal or abnormal (col 17 ln 55-62); and further comprising a step of identifying as an undetermined nozzle a nozzle to be driven next to a nozzle determined in said determination step to be defective (col 18 ln 48-57); a decision step of executing said driving step and said storage step again for the nozzle identified as the undetermined nozzle (col 19 ln 49-53) and deciding a second threshold for determining whether the undetermined nozzle is non-defective (col 18 ln 48-57); and a step of determining whether the undetermined nozzle is non-defective or defective, on the basis of the second threshold decided in said decision step (col 19 ln 49-53)." It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to so modify the calculation step and determination step as well as add a decision step and an additional determination step for undetermined nozzles. One would have been motivated to so modify Bruch et al. for the benefit of improving the accuracy of determining the condition of each nozzle as well as dealing with undetermined nozzles.

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14. Regarding claim 4, Bruch et al. disclose the claimed invention as set forth above with respect to claim 1. Thus Bruch et al. meet the claimed invention except the limitations set forth in claim 4.

15. Vega et al. teach that “a plurality of neighboring nozzles of the head are divided into blocks, the threshold is calculated for each block in said calculation step, and it is determined whether the nozzle is non-defective or defective for each block in said determination step (col 6 ln 41-51 and col 18 ln 31-39).” It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to divide neighboring nozzles into blocks and perform the calculation step and determination step on each block. One would have been motivated to so modify Bruch et al. for the benefit of reducing the time it takes to determine the discharging state of the nozzles on a head by examining them in groups.

16. Regarding claim 9, Bruch et al. disclose “an apparatus for determining a discharging state from each nozzle of a head that discharges liquid droplets (400 of fig 4), comprising: driving means for driving each of nozzles of the head to discharge liquid droplets (905 of fig 9 and col 10 ln 12-14); storage means for detecting a discharging state from each nozzle driven by said driving means (810 of fig 8 and col 6 ln 38-41) and storing the discharging state as a physical amount (530 of fig 5, col 10 ln 4-7); calculation means for calculating an average value and a standard deviation of the physical amounts stored by said storage means (col 11 ln 66 – col 12 ln 1, col 12 ln 20-24)... for determining whether the discharging state from each of the nozzles of the head on the basis of the average value and the standard deviation (col 11 ln 66 – col 12

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ln 1, col 12 ln 20-24)...” Thus, Bruch et al. meet the claimed invention except the two thresholds, determination means, decision means, and additional determination means set forth in claim 9.

17. Vega et al. teach using “at least two thresholds (col 6 ln 20-24)...wherein one of the thresholds is for determining as normal and another is for determining as abnormal (col 17 ln 55-62); determination means for evaluating the physical amount corresponding to each nozzle on the basis of said at least two thresholds calculated by said calculation means (col 19 ln 47-49) and determining whether the discharging state of each nozzle is normal or abnormal, or undetermined because of the physical amount lying between the one and another thresholds (col 19 ln 49-53, col 18 ln 48-57); decision means for executing processes of said driving means and said storage means again for the undetermined nozzle which is determined by said determination means not to be non-defective or defective (col 19 ln 49-53), and deciding a threshold for determining whether the undetermined nozzle is non-defective (col 18 ln 48-57); and means for determining whether the undetermined nozzle is non-defective or defective, on the basis of the threshold decided by said decision means (col 19 ln 49-53).” It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to so modify Bruch et al. by the addition of the calculation means, determination means, decision means and an additional determination means for undetermined nozzles. One would have been motivated to so modify Bruch et al. for the benefit of improving the accuracy of determining the condition of each nozzle as well as dealing with undetermined nozzles.

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18. Regarding claim 10, Bruch et al. disclose “an apparatus for determining a discharging state from each nozzle of a head that discharges liquid droplets (400 of fig 4), comprising: driving means for driving each of nozzles of the head to discharge liquid droplets (905 of fig 9 and col 10 ln 12-14); storage means for detecting a discharging state from each nozzle driven by said driving means (810 of fig 8 and col 6 ln 38-41) and storing the discharging state as a physical amount (530 of fig 5, col 10 ln 4-7); calculation means for calculating an average value and a standard deviation of the physical amounts stored by said storage means (col 11 ln 66 – col 12 ln 1, col 12 ln 20-24)... for determining whether the discharging state from each of the nozzles of the head on the basis of the average value and the standard deviation (col 11 ln 66 – col 12 ln 1, col 12 ln 20-24)...” Thus, Bruch et al. meet the claimed invention except the two thresholds, determination means, identifying means, decision means, and additional determination means set forth in claim 10.

19. Vega et al. teach using “at least two first thresholds (col 6 ln 20-24)... wherein one of the thresholds is for determining as normal and another is for determining as abnormal (col 17 ln 55-62); determination means for evaluating the physical amount corresponding to each nozzle on the basis of said at least two thresholds calculated by said calculation means (col 19 ln 47-49) and determining whether the discharging state of each nozzle is normal or abnormal, or undetermined because of the physical amount lying between the one and another thresholds (col 19 ln 49-53, col 18 ln 48-57); means for identifying as an undetermined nozzle, a nozzle to be driven next to a nozzle determined by said determination means to be undetermined (col 18 ln 48-57); decision

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means for executing processes of said driving means and said storage means again for the nozzle identified as the undetermined nozzle (col 19 ln 49-53), and deciding a second threshold for determining whether the undetermined nozzle is non-defective or defective (col 18 ln 48-57); and means for determining whether the undetermined nozzle is non- defective or defective, on the basis of the second threshold decided by said decision means (col 19 ln 49-53)." It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to so modify Bruch et al. by the use of two thresholds, determination means, identifying means, decision means and an additional determination means for undetermined nozzles. One would have been motivated to so modify Bruch et al. for the benefit of improving the accuracy of determining the condition of each nozzle as well as dealing with undetermined nozzles.

20. Regarding claim 11, Bruch et al. disclose the claimed invention as set forth above with respect to claim 8. Thus Bruch et al. meet the claimed invention except the limitations set forth in claim 11.

21. Vega et al. teach an apparatus as claimed in claim 11 for performing the method set forth above with respect to claim 4. It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to divide neighboring nozzles into blocks and perform the calculation means and determination means on each block. One would have been motivated to so modify Bruch et al. for the benefit of reducing the time it takes to determine the discharging state of the nozzles on a head by examining them in groups.

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22. Regarding claim 16, Bruch et al. and Vega et al. disclose the claimed invention as set forth above with respect to claim 9. Thus the Bruch et al. and Vega et al. combination meets the claimed invention except "an ink-jet printer comprising an apparatus recited in claim 9."

23. Bruch et al. teach "an ink-jet printer comprising an apparatus recited in claim 9 (col 3 ln 61-64)." It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to include the apparatus recited in claim 9 in an ink-jet printer. One would have been motivated to so modify the Bruch et al. and Vega et al. combination for the benefit of improving the functionality of the head of an ink-jet printer.

24. Regarding claim 17, Bruch et al. and Vega et al. disclose the claimed invention as set forth above with respect to claim 10. Thus the Bruch et al. and Vega et al. combination meets the claimed invention except "an ink-jet printer comprising an apparatus recited in claim 10."

25. Bruch et al. teach "an ink-jet printer comprising an apparatus recited in claim 10 (col 3 ln 61-64)." It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to include the apparatus recited in claim 10 in an ink-jet printer. One would have been motivated to so modify the Bruch et al. and Vega et al. combination for the benefit of improving the functionality of the head of an ink-jet printer.

26. Claims 5, 6, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bruch et al. in view of Nohata et al.

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27. Regarding claim 5, Bruch et al. disclose the claimed invention as set forth above with respect to claim 1. Thus Bruch et al. meet the claimed invention except "the physical amount includes a discharging time of droplet."

28. Nohata et al. teach "the physical amount includes a discharging time of droplet (col 6 ln 23-26)." It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to measure a discharging time of droplet. One would have been motivated to so modify Bruch et al. for the benefit of making the system more robust by having another attribute to determine the condition of the nozzle, improving the accuracy in determining the condition.

29. Regarding claim 6, Bruch et al. further disclose "the physical amount includes a delay time until discharged droplet is detected after driving for discharge (910 of fig 9)."

30. Regarding claim 12, Bruch et al. disclose the claimed invention as set forth above with respect to claim 8. Thus Bruch et al. meet the claimed invention except "the physical amount includes a discharging time of droplet."

31. Nohata et al. teach "the physical amount includes a discharging time of droplet (col 6 ln 23-26)." It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to measure a discharging time of droplet. One would have been motivated to so modify Bruch et al. for the benefit of making the system more robust by having another attribute to determine the condition of the nozzle, improving the accuracy in determining the condition.

Allowable Subject Matter

32. Claims 18-21, 23, and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

33. The following is a statement of reasons for the indication of allowable subject matter: The prior art does not disclose or suggest the claimed obtaining "the threshold on the basis of the average value and the standard deviation $\times N$ (N =any one of 3,4,5 and 6)" in combination with the remaining claim elements as set forth in claims 18-21, 23, and 25.

Response to Arguments

34. Applicant's arguments with respect to claims 1 and 8-10, as well as their respective dependent claims, have been considered but are moot in view of the new ground(s) of rejection.

35. Regarding claim 1 and 8-10, Bruch et al. disclose calculating an average value for each nozzle and setting the threshold level for each nozzle based upon this calculated average and its standard deviation, as set forth above (see col 11 ln 65 – col 12 ln 1 and col 12 ln 20-24).

36. Applicant's arguments with respect to claims 2-5, 9-12, 16, and 17 have been fully considered but they are not persuasive.

Conclusion

37. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Goldberg whose telephone number is 571-272-2728. The examiner can normally be reached on Monday through Friday, 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Talbott can be reached on 571-272-1934. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BJG



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